Abstracts (2019)

The following abstracts accompanied posters presented at the seventh annual multidisciplinary Undergraduate Research Fair held at York University (Toronto, Canada) in March 2019. The poster images can be viewed by clicking on the abstract titles in the "Abstracts & Posters" section on the Revue YOUR Review *website:*

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ZUNAIRA AMIN

Biculturalism and Psychological Well-Being

Investigating the role of socioeconomic status

This online study investigated the role of socioeconomic status in previously established relationships between bicultural identity integration (or bicultural self-efficacy) and psychological well-being (or life satisfaction) among bicultural immigrant students at a large Canadian university (N = 403). A comprehensive measure of socioeconomic status was utilized to measure income, level of education, and occupational status of participants' guardians, as well as to determine participants' access to financial resources and sources of psychosocial supports and stressors (in the domains of interpersonal relationships, home and neighbourhood environment, individual health, and religious affiliation). The study found that socioeconomic status is responsible for a large variance in the relationship between bicultural identity integration (or bicultural self-efficacy) and psychological well-being (and life satisfaction). Within socioeconomic status, the domains of interpersonal relationships and surrounding environment were significant contributors to these relationships, while guardians' incomes, levels of education, and occupational statuses were insignificant along with participants' financial resources, individual health, and religious affiliation.

BABNI ARYOBI

The Effects of Climate Change on the Survival of Polar Bears (Ursus Maritimus) in Western Hudson Bay of the Canadian Arctic

The Canadian Arctic is home to approximately two-thirds of the world's polar bear population. In the Hudson Bay, polar bears are dependent on sea ice for survival and are now on the verge of extinction due to increased Arctic melt caused by climate change which greatly affects their survival during the open-water season. This research project aims to find out how the survival of polar bears in Western Hudson Bay has been affected by climate change during the open-water season. Relevant studies were reviewed to investigate how significant results have supported this research. In the Western Hudson Bay, climate change has reduced the ice coverage to about 50 percent from 1970 to 2004; this forces polar bears to fast seven to eight days earlier every decade. Thus, polar bears are forced to deal with prolonged periods of fasting during the open-water season, mainly due to the scarcity of goods, which greatly affects their survival.

MELINAZ BARATI

Reach After-Effects as a Measure of Implicit Learning After Abrupt and Gradual Visuomotor Rotations

Humans have an incredible ability to learn new movements and adapt our movements to changing circumstances. Visuomotor adaptation can be observed when subjects reach out to a target holding a cursor with their unseen hand while the visual feedback of the cursor's motion is manipulated. Motor adaptation engages both implicit and explicit learning processes. Some measures of motor adaptation are considered to measure primary implicit learning, such as reach after-effects, which occur when subjects continue to make deviated reaches after the cursor's rotation has been removed. In this study, we look at how a higher contribution of implicit learning influences visuomotor adaptation as measured in reach after-effects and retention. We changed the contribution of implicit learning by introducing the visual feedback of the cursor's rotation either abruptly or gradually. An abrupt change in cursor's motion is more likely to be recognized by subjects, thus, it should evoke more explicit learning and a gradual change should evoke more implicit learning. We expect greater reach after-effects and retention of learned hand movements following gradual rotation training. Participants (N=27) did both a gradual and abrupt version of the same visuomotor adaptation task in a counterbalanced order. Contrary to our expectations, we found no difference between reach after-effects and retention in the two conditions. Perhaps an even larger, more explicit deviation would be necessary to reveal relative contributions of explicit and implicit adaptation to gradually and abruptly introduced visuomotor perturbations.

YASMIN DINI

Canadian Pharmacare

A tough pill to swallow

As communicable diseases continue to devastate low-income countries and non-communicable diseases elevate the global burden of disease, policymakers are beginning to investigate how to best reform the pharmacare system to meet the growing demand. The current discourse surrounding pharmacare accessibility heavily focuses on the perils of intellectual property rights. Although this is a central component to understanding and addressing the issue, it lacks contextual depth. This article frames the debate around the historical and contemporary frameworks which inform pharmaceutical policy and practises; namely capitalism, colonialism and imperialism. This is through an exploration of the governance mechanisms and power structures that are in place both locally and globally. This article also presents a case study of the Cuban healthcare system to appraise its quality and the possibility of expanding similar practices to the Canadian system. This investigation found that current pharmaceutical governance models are inadequate in protecting global health interests, that a self-sufficient national pharmaceutical system like the one implemented in Cuba can create health outcomes that surpass high-income counterparts, and that current ideologies and practises are only effective in profit creation, not the creation of equitable health outcomes. The author attempts to use this analysis to inform awareness campaigns and possible policy reform within a Canadian context. As the Canadian public and government continue to discuss the possibility of implementing a national pharmacare program, insight into how this nation can meet the needs and become a global provider would be incredibly valuable.

ASMA EL GAOUD

A Hypothesized Role of Uncharacterized Gene CG 10809 in Parkinson Disease and Neurodegeneration

This study looks at different resources that implicate the function of the CG10809 unknown gene and designs an experiment to verify (or falsify) the hypothesis. Given the evidence and information, we predict that the CG10809 is a calcium ion transport channel protein that is part of the nuclear pore complex.

ALLISON EVANS

Green Roofs

The sky's the limit in Toronto

In a 2012 speech, United Nations Secretary-General Ban Ki-moon called for the world's mayors and local governments to engage in the creation of sustainability policy for cities by stating that "Our struggle for global sustainability will be won or lost in cities." The application of green roofs at a city-wide scale improves urban sustainability and is a function of local government policy creation. The City of Toronto introduced a municipal green roof by-law to increase the amount of green roof space to primarily mitigate the urban heat island effect and decrease the amount of stormwater runoff. However, there are many benefits to green roofs beyond these two functions. This research presentation uses the City of Toronto as a case study to understand the role of policy in green roof implementation at a city-wide scale before analyzing the benefits of green roofs for cities from an architectural, ecological, and planning perspective. In an increasingly urbanized world, transforming densely populated urban agglomerations into sustainable spaces is a critical component to mitigating the effects of climate change. Green roofs increase the sustainability of urban areas, and with careful consideration of the negative aspects, help create healthier cities. The City of Toronto's green roof bylaw as a case study is a useful guide for cities wishing to create evidence-based green roof policies which contribute to healthier cities and a more sustainable global urban future.

SARAH EWEN

Evaluating the Use of Picture Books and "Read Aloud" Discussions to Explore Complex Topics with Kindergarten Students

Read-aloud discussions are highly recommended for classroom literacy practice and for stimulating classroom discussion. In this lesson plan, the practice of read-aloud discussions was explored with respect to its potential to teach kindergarten students about complex concepts such as community awareness. To address this research question, we conducted the read aloud with a book about community with four students. Students' comments and reflective drawings were then utilized to assess the effectiveness of the activity. Overall, we determined through this lesson plan that complex topics can be explored through read-alouds and that learning does not have to be a linear process.

DANIELA HERNÁNDEZ CUADRA

The Quinoa We Grow

This paper illustrates how quinoa (Chenopodium quinoa Willd.) is an important crop because of its potential to help fight poverty and significantly impact the global food shortage crisis. This work also provides a detailed profile of quinoa as an angiosperm that highlights the notable peculiarities which make the crop highly stress-resistant and adaptable to a wide range of conditions. Two approaches were taken to describe the plant: biological, to highlight its advantages, and sociocultural, to mark its significance. We conclude that the popularity of Chenopodium quinoa Willd. will increase in the upcoming years. This is something to be aware of because, although international organizations are focusing on bringing it to the impoverished, increased popularity and improved reputation typically persuade sellers to increase the price of a product. Thus, a crop selected to fight hunger may become too expensive for those who need it the most.

AMEENA HOSSEIN

Vitamin C

Nature's 'flu shot'

Annually millions of people heed the multiple flu warnings and flock to walk-in-clinics and hospitals to receive their flu shot. However, many still end up contracting the flu. Consuming high doses of vitamin C is a low-cost, proven means of both preventing and treating influenza by enhancing overall immune function. With new strains of influenza arising each year and with the flu shot becoming increasingly ineffective, vitamin C needs to be implemented into our diets via oral or inhalational supplementation and used as a means of resistance.

MANDY HUYNH

Can We Predict and Prevent a Flash Flood Disaster in the Desert?

Desert flash floods are an intense and unpredictable natural phenomenon that kill many individuals and destroy many homes. This study focuses on the formation of flash floods in the desert, their impact, and the technology used to predict and prevent flooding events. A reading of the primary literature found that, despite the destruction caused by flash floods, they are a necessary phenomenon to recharge groundwater, support plant diversity, and maintain the population of native fish species. Predicting locations prone to flash floods became possible when GIS and remote sensing technology became more advanced. However, it is still very difficult to accurately identify all areas prone to flash floods. The timing of flash floods is even harder to determine. It is important to educate the public on the risk of living in areas prone to flash floods.

HONG SEOK KIM

An Ancient Greek Problem

Can We Trisect an Angle with Ruler and Compass?

Ancient Greek mathematics is considered to be the most important and basic foundation of modern mathematics. Many great mathematicians discovered theorems and formulas which are fundamental to modern mathematics. For example, most individuals learned the Pythagorean theorem in elementary school. Euclid's Elements is known to be the greatest textbook in the history of math up until the 12th century. However, there were many other problems that cannot be solved; one of them is angle trisection. Trisection is the process of dividing something into three equal parts. Our goal was to prove the impossibility of trisection of an angle using only a ruler and compass.

HELEN LAM & THABESA KASINATHAN

Newcomers with Disabilities

Challenges and service implications

On June 18, 2018, Canada changed the medical inadmissibility policy for immigrants and refugees to be more welcoming of people with disabilities. To better understand the needs of this population, this project reviews the challenges faced by immigrants and refugees who have physical disabilities in Canada. Results suggest logistical, emotional, and community challenges, with implications for social work. A literature search was conducted to find peer-reviewed journal articles about immigrants and refugees with physical disabilities in Canada. Challenges were categorized into themes and analyzed in terms of how they lend themselves to social work.

RAVEN LOVERING

Sculpting Gender Relationships

Classical idealization in *Pygmalion and Galatea* (1813–1819)

The extent to which idealization is visible in Anne-Louis Girodet's classical painting Pygmalion and Galatea (1813-19) is explored through the critique of classical elements and a comparison to an earlier biblically based work: Palma Vecchio's painting Adam and Eve. The flawless depiction of their ivory bodies moves away from a model of realism in order to embellish subjects and reinforce traditional gender roles. Comfortable within the literary canon, the myth of Pygmalion involves the creation of the ideal woman who displays physical features such as a tiny waist and glowing skin that continues to be viewed as desirable today. The depiction of the myth presents a power struggle between man and woman, and man and religion, through Pygmalion's creation of his ideal woman with divine intervention.

CHRISTINA MARTON

The Distribution, Behaviour, and Reproduction of the Endangered Desert Pupfish (Cyprinodon Macularius)

The pupfish is a small sized fish species found in North American deserts that is being threatened by water loss resulting from climate warming. These desert-adapted fish have unique characteristics in their distribution, behaviour, and reproduction that has allowed them to tolerate the extreme desert climate and adapt to survive climate warming which is eliminating the few suitable environments available for survival. Through peer reviewed scientific journals, this amazing species can be studied and analysed for its favorable traits and adaptations to environmental conditions so researches not only understand the unique characteristics this species has evolved to survive in extreme desert environments but also to seek out and create access to safe spaces for the species to populate. This understanding will not only prevent the loss of another species to the effects of a changing climate resulting from human activity, but also give insight into the characteristics that other desert species may be using to survive one of the world's most extreme environments.

ERIC MOKRI

Elite Skill and Concussion

It is commonly known that elite athletes in the sport of ice hockey have superior eye-hand coordination and visuomotor skill allowing them to perform at the highest level in their sport when compared to the non-elite population. Previous research has identified a protective motor skill reserve in asymptomatic elite athletes with a history of concussion. This study sought to explore the possibility of lingering visuomotor effects in elite asymptomatic athletes with concussion history. This study sampled male NHL draft prospects and male Kinesiology & Health Science students at York University (Toronto) to examine their visuomotor skills when learning to perform a novel motor learning task. Haptic robotic equipment was used to create a virtual environment allowing participants to navigate the movement tracer around obstacles in the x, y, and z planes of motion. This study supports the findings that the suspected impairments in visuomotor skills are not apparent between elite athletes with and without concussion history when analyzing key performances measures outlined to participants as goals for the task: fastest time to complete the task, and the number of obstacles hit. When analyzing the progression in performance between the three groups studied, it was found that the elite and non-elite groups having no concussion history demonstrated similar improvement outcomes over the course of the ten trials when visuomotor skill was self-controlled by each participants' motor skills. The elite group with concussion history displayed variable and inconsistent performance through the progression of their consecutive trials at the novel motor learning task.

ALEXANDER MOWBRAY

Walmart

The benefits of outsourcing

This study is based on the controversial topic of multinational corporations outsourcing their production lines to nations with lower standards for work safety. I believe that outsourcing not only affects the corporation in a positive way, but it also economically helps individuals in those countries. Through my analysis that included topics such as the bottom line of Walmart's financial statements, real-life events that included an increase in jobs in those countries, negative events that occurred in these countries such as factories collapsing, and events in the past that affected the safety standards in the United States, I conclude that my belief favours outsourcing. This project identifies both the positives and negatives to outsourcing and critically analyzes them.

JOHN NGUYEN

Determining the Potential Role of the Drosophila Gene CG12299 in Cytoskeletal Development with Emphasis on Neuronal Development Related to Amyotrophic Lateral Sclerosis

Drosophila melanogaster is a species of fly which has been used for over a century as a model organism. Two benefits of using Drosophila as a model organism is that it has a fully sequenced genome and it contains homologs to at least 75% of human genes. However, many different genes in the Drosophila genome still have uncharacterized functions. One such gene is CG12299 which, when mutated in a Drosophila model of amyotrophic lateral sclerosis (ALS), has been shown to reduce the severity of an ALS model-associated phenotype, resulting in an appearance approaching that of an unaffected (wild type) fly. This suggests that CG12299 plays a role in the pathogenesis of ALS and determining its function could lead to a better understanding of ALS and the development of novel therapeutics for the treatment of ALS. In this project, the function of CG12299 was predicted using multiple literature searches (which included a comparison of the amino acid sequence of the protein produced by the CG12299 gene to the amino acid sequence of proteins with known functions from other species), an analysis of the expression pattern of CG12299 across the body of the flies, and a search and characterization of the proteins known to interact with the gene product of CG12299. Multiple potential experiments were also designed which could determine the function of CG12299. It is hypothesized that CG12299 is involved in the development of the cytoskeleton in neuronal cells and, since the cytoskeleton is essential to maintaining cell viability, any disruption to the cytoskeleton will lead to cell death, as seen in individuals affected by ALS.

EKI OKUNGBOWA

"Womb for Rent"

Socio-cultural implications of reproductive tourism in India

Commercial surrogacy in India has become an increasingly controversial human rights and global health issue. Indian women living in dire poverty are the most vulnerable group in this transnational phenomenon. Reproductive tourism can be defined as the process whereby affluent people, predominately from Global North countries (i.e., Canada) seek assisted reproduction in the Global South (in this case, India), to accomplish fertility and kinship formation goals while remaining oblivious to the inevitable social issues associated with this international trade. This study investigates how the media and academic anthropological research present current understandings of family and kinship regarding commercial surrogacy. I argue that reproductive tourism is a multi-faceted social issue with significant socio-cultural implications for kinship in India and the Global North with roots in a gendered division of labour, culture-specific belief systems, technological advancement, race and class stratification, capitalist structures, and globalization. I critically analyze diverse media sources that offer insights within these realms, and I use research in anthropology as ethnographic evidence to support, challenge, or extend claims reported by the media. The commodification of reproductive labour has had vast impacts on the cultural meanings of kinship in India and in Global North countries. Transnational surrogacy must be perceived by governments as a public matter rather than a private one, in order to adequately derive holistic solutions to halt the exploitation of vulnerable Indian women while balancing the desire of infertile individuals to utilize surrogacy as a means of kinship formation.

ARIANNA PECCHIA

Luca Pacioli's Influence on Modern-Day Accounting

In this study, Luca Pacioli's influence on current accounting practices is demonstrated by comparing the times prior to, during, and after Pacioli's records. Through extensive research, it becomes evident that Pacioli did impact the way in which accountants currently record transactions.

EVANIA PIETRANGELO–PORCO

A Patriotic Fan Letter in the Archives

The purpose of this project was to perform an in-depth analysis of selected materials in the Clara Thomas Archives and Special Collections (York University, Toronto). This study focused on what we, as historians and patrons of the Archives, can learn about a particular author or individual from a set of documents. The document I chose was a fan letter written to Canadian author Margaret Laurence about her book The Stone Angel. I debate whether the letter, written by Dawn E. Clarke in 1972, endures in the Clara Thomas Archives because of, or in spite of, Margaret Laurence. I approached my analysis, first and foremost, by examining the items in the Margaret Laurence Fonds. I chose Dawn E. Clarke's letter because it was the only document in the fonds to discuss The Stone Angel. I then analyzed the letter's content, physical characteristics such as Clarke's handwriting, and considered the reasons why this particular document was archived. I deduced the following: Dawn's handwriting, word choice, and neat presentation of her letter suggest she held Laurence in high esteem. Dawn's admiration and her national pride establishes Canada as a viable literary destination. Dawn acknowledges her role as a female reader and asserts her right to this readership and even authorship by composing her document. The existence and preservation of this document show the impact of an author on an individual.

LINDSEY SWARTZMAN

In the Closet

Intimate partner violence in same-sex female relationships

Over the course of the past several decades, the issue of intimate partner violence (IPV) has become increasingly prevalent in research, legislation, and public discourse. Although the concept of IPV has evolved to include people who are in non-marital relationships, there is a noticeable lack of research on IPV in the LGBTQ+ community. This study explores why the phenomenon of female same-sex intimate partner violence (FSSIPV) is ignored. There is evidence that a correlation exists between the use of traditional measurement instruments of IPV and the absence of FSSIPV. What has become abundantly clear is that IPV is often framed within a heteronormative, gender stereotypical context, thus making it very difficult to include FSSIPV in the discussion. This is because FSSIPV fundamentally challenges both the notion of what a "normal" relationship looks like within the context of a heteronormative society, and how gender stereotypes manifest in IPV. Further research needs to be conducted to create FSSIPV-specific measurement tools that can capture the nuances of the phenomenon, as well as restructure victim services to meet the needs of victims. Finally, further resources must be allocated for educating both healthcare providers and the general public on how stereotypes can influence what is perceived as IPV.

ADI VARSANO

The Impacts of Oil Sand Operations on the Development, Survival, and Reproductive Capabilities of Fathead Minnows (Pimephales Promelas) in Alberta, Canada

Toxic contaminants discharged from oil sands mining processes are accruing in and around freshwater environments. The aim of this review is to arrive at a consensus regarding the impacts that these toxic pollutants have on the development, survival, and reproductive capabilities of fathead minnows or Pimephales promelas—a species of ray-finned fish in Alberta, Canada. The choice to focus specifically on fathead minnows was based on the fact that they are an indicator species, commonly used in environmental toxicology assessments. Additionally, they are both abundant and native to the oil sands region of Alberta. Based on my findings, toxic pollutants such as naphthenic acid fraction components, can either induce increased mortality of fathead minnow embryos or increase developmental abnormalities (typically cardiovascular irregularities) during hatching. Furthermore, wastewater generated from oil-sand handling can, for example, increase their hematocrit levels (ratio of red blood cells), decrease their leucocrit levels (ratio of white blood cells), and circulate lymphocytes in the blood. This suite of potential developmental complications has been observed to reduce the survivorship of fathead minnows. Lastly, large quantities of toxic pollutants, such as naphthenic acid accumulating in freshwater ecosystems, impairs the reproductive physiology of fathead minnows. The accumulation of toxic pollutants released by oil sands mining operations in freshwater ecosystems is significantly impairing the life cycle of the fathead minnow. It appears that even the smallest doses of such pollutant, can cause in detrimental effects on fathead minnow populations.

RHEA VIRKUTIS

Tapping into Health Disparities

Canada's Indigenous water crisis

In Canada, many Indigenous communities experience environmental racism through the appalling lack of access to safe drinking water. The well-documented health challenges posed by the denial of this basic human right disproportionately affect Indigenous populations. The continuing oppressive impacts of colonization are evident, given that current public perceptions and policy decisions discriminate against Indigenous peoples. Water system maintenance is a public health necessity, and the government has recklessly off-loaded this responsibility onto Indigenous populations, despite their varying degrees of social, financial, and structural ability to manage this crucial task. By boiling down the overlapping historical and cultural conditions that have allowed this state to develop and perpetuate, this research explores how health policies can strategically enact multi-faceted and tailored approaches to end this injustice. The results demonstrate that current top-down Indigenous health policy tactics are failing and will continue to destroy the lives of many people. Spiritual, mental, and physical health are interconnected and, when analyzing these through a water access lens, the negative effects are visible at the population level. Many Indigenous people have lost faith in the future, given that their circumstances are failing to improve; this is compounded by severe physical ailments resulting from bathing in and consuming tainted water. Moving forward, policy planning needs to address the various social determinants of health that are disadvantaging Indigenous populations while collaborating with communities to develop approaches formulated to address their unique needs.

SARA WASEF

Effects of Sex Hormones on Central Chemoreflex Function

Women in the low hormone phase of the menstrual cycle (LH) have greater light headedness compared to when they are in the high hormone phase (HH). Both cerebrovascular reactivity to CO2 and central chemoreflex activity might play a role since CO2 can elicit both cerebrovascular dilation and activation of sympathetic nerve activity (SNA). Research has shown that women in the HH phase demonstrate higher SNA and may also have higher cerebrovascular reactivity. We investigate the effect of hypercapnia on ventilatory and cerebrovascular responses in women throughout the menstrual cycle. Women (n=8) breathed five minutes of 5% CO2 during LH (day 2–5 or placebo pill) and HH (day 18-24 or maximal dose pilQ phases). Ventilation (Ve; Pneumotachometer), blood flow velocity through the middle cerebral artery (MCA; Transcranial Doppler), and blood pressure (BP; ccNexFin) were measured. Ve equals tidal volume x breathing rate. Cerebrovascular conductance index (CVCi) equals MCA mean + BP. Paired t-tests were used to compare the change due to CO2. There was no effect of phase on the Ve response to CO2 (LH: +0.09± 0.081/min; HH: +0.10± 0.091/min; p; 0.57) though there was a tendency for a greater increase of CVCi in the HH phase during CO2 inhalation (LH: +0.11±0.08cm/s/mmHg; HH: +0.19±0.09 cm/s/mmHg; p; Q,08). Furthermore, there was no effect of phase on the BP response to CO2 (LH: +2.16±2.94mmHg; HH: +1.81±2.20mmHg; p; Q.63). Our results suggest that the presence of estrogen and progesterone may not affect the central chemoreflex but tends to increase cerebrovascular reactivity.

CHARLOTTE WEST

Deforestation

How tree loss affects climate

Deforestation and climate change are two of the biggest environmental disasters facing the planet today. It is important to understand the interaction between these threats. Using meta-analysis, we looked at the effect that deforestation has on climate as well as on climate change. Ten research papers were selected from a pool of twenty-five on large rain forests, and these were used for statistical analysis. In order to produce relevant and applicable results, the studies were restricted to the last five years. We found that deforestation has both regional and global impacts on climate. This result has significant implications because it shows that slowing deforestation is critical not only for the local environment but also for the entire global climate.